Remarks

The following headings in these remarks correspond to the headings in the Office

Action.

IDS

Only one of the references in the Information Disclosure Statement has an English

language patent within the family of patents:

EP 0 837 394 A2 ;   US 6,466,539 B1.

The remaining documents will be translated as appropriate.

Title

The Title of the application is confirmed to read

"Safety-related bus automation system"

Drawings

Enclosed is a letter to the Draftsperson of the Patent Office proposing changes to

overcome the Examiner's requirement to illustrate features in the description and claims.

Adequate labeling has been provided for empty boxes in the drawings.

Specification

The specification is amended to overcome the objections in numbered paragraph

5 of the Office Action. (paragraphs 0001, 0002, 0003, and 0005)

[0001]   The invention relates to a safety-related automation bus system

comprising: at least a bus, I/O bus subscribers connected to the bus, a standard control

device, at least one safety analyzer which monitors data flow via the bus system and is

designed to carry out at least one safety-related function, and to a method for operation of

such a system.

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[0002]   Control and data transmission systems have gained a dominant position not only in industrial manufacturing owing to the high level of automation that they make possible. Such automation systems generally have at least sections or components an on which more stringent requirements with respect to safety may be placed. For example, it is necessary to ensure that certain machines are operated within predetermined operating parameters, or it is necessary to prevent a machine from running even though someone is located in its operating area. In this context, for example, a lathe must not exceed a predetermined rotation speed or there must not be anyone in the radius of action of a robot, when that robot is being operated. Furthermore, when operating an automation system, it is necessary to ensure that, if one component in the system fails, the system does not change to an undefined, and hence unpredictable, state.

[0003]   On approach to this problem according to the prior art is, in particular, to use a number of channels for the safety-relevant components in the system, that is to say to design them to be redundant. For example, safety bus components, that is to say for example bus subscribers which are associated with a safety-relevant machine, may be duplicated in an automation bus system. At the same time, the central control and the bus may have a number of channels, or even a specific safety control system, which is separate from the process control system and in some circumstances is of redundant design, for controlling the safety-relevant components. This safety control system essentially carries out the logic links an and the safety-related input information and then transmits, for example via an automation bus, safety-related logic linking data to output components. The output components themselves process the received safety measures and, if the test result is positive, output this to the peripherals. Furthermore, they switch

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their outputs to a safe state if they find a fault, or have no longer received any valid data within a predetermined time period.

[0005]   DE 198 15 150 A1 discloses a system which comprises an evaluation unit which is connected to the bus, continuously monitors the symbols transmitted via the bus system, and starts up a piece of equipment only when codings which are transmitted via the bus system are identified without any errors. To this end, the input data sent by the bus subscriber to the master is evaluated, and the piece of equipment is switched ~~an~~ <u>on</u> or off in response to the evaluation.

<center>Claim Rejections - 35 USC 112</center>

Claims 47-66 are rejected as being unclear as to whether Applicant intends to claim a system or a method.

The Examiner points out that the claims 47 to 66 are indefinite because of their dependency on claims 32 to 46. To overcome this objection the dependency in claim 47 has been deleted.

<center>Claim Objections</center>

References in parentheses to numbers found in the drawings given in the claims have been removed.

In order to meet the objection of insufficient antecedent basis concerning claim 59 the following amendments have been made:

"the safety data item" has been changed into

"a safety data item" and

"the negated safety data item" has been changed into

"a negated safety data item."

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Claims Rejections - 35 USC 102

Claims 32-37, 39, 42-57 and 64-66 are rejected as being unpatentable over Roth et al (Roth).

Claim 32 is amended to change the feature of "the safety analyzer having a device for manipulating the datastream transmitted on the bus" from an optional to a mandatory feature.

In addition we adopt the feature that "the safety analyzer is connected to the bus separately by means of an appropriate interface" into claim 32.

Further, we adopt the features of claim 56 into claim 47 with the following wording:

wherein at least one step selected from a group consisting of overwriting at least one data item in the bus datastream, deleting at least one data item in the bus datastream and inserting at least one data item into the bus datastream is performed by the at least one safety analyzer by means of a device for manipulating the datastream on the bus.

Accordingly, claim 56 has been deleted in our amended claims.

Valid rejection under 35 USC 102 requires that each feature of a rejected claim be disclosed in a single reference. "For anticipation under 35 USC 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present." MPEP 706.02(a)

Roth does not disclose each feature of the rejected claims.

Roth describes an automation system with different functional units, like for instance a power module, a control unit or an operating unit, each of which is monitored

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by its own safety device. The safety devices are interconnected by means of a bus in order to exchange data. In the case of a malfunction of a functional unit or safety device, a safety-relevant actuator is operated.

The above mentioned feature of manipulating the datastream on the bus, especially of overwriting, deleting or inserting at least one data item in the input or output data produced by a standard control, is not disclosed by Roth.

Further, from the feature adopted into claim 32 that the safety analyzer is connected separately to the bus by means of an appropriate interface it follows that the safety analyzer does not have to be a logic bus subscriber. In this respect the present claims differ significantly from the system described by Roth, in which several safety devices - one for each functional unit - are necessary, all of which are logic bus subscribers, since they are interconnected by means of the bus.

Therefore, it is respectfully submitted, that subject matter of claims 32 and 47 are not anticipated by Roth.

Claim Rejections - 35 USC 103

Claims 58 and 59 are rejected as being unpatentable over Roth in view of Fulton et al. (Fulton).

Claims 38, 40-41, and 60-63 are rejected as being unpatentable over Roth further in view of Roth II.

Valid rejection under 35 USC 103(a) requires evidence of a suggestion or motivation for one skilled in the art to combine prior art references to produce the claimed invention. US Court of Appeals for the Federal Circuit (*Ecolochem inc. v Southern California Edison Co., Fed. Cir.*, No. 99/1043, 9/7/00).

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The best defense against hindsight-based obviousness analysis is the rigorous application of the requirement for showing a teaching or motivation to combine the prior art references; according to the court

Fulton, Roth and Roth II, do not motivate or suggest to one skilled in the art to combine these references to produce Applicant's claimed invention.

Recently, in In Re Sang-Su Lee (00-1158) the Court of Appeals for the Federal Circuit rendered a decision confirming the above principles. The court analyzed 35 USC 103 requirements starting from the Administrative Procedure Act and held (citations omitted):

"Tribunals of the PTO are governed by the Administrative Procedure Act, and their rulings receive the same judicial deference as do tribunals of other administrative agencies.

"The Administrative Procedure Act, which governs the proceedings of administrative agencies and related judicial review, establishes a scheme of "reasoned decision making." Not only must an agency's decreed result be within the scope of its lawful authority, but the process by which it reaches that result must be logical and rational.

"As applied to the determination of patentability vel non when the issue is obviousness, it is fundamental that rejections under 35 USC §103 must be based on evidence comprehended by the language of that section. (Emphasis added). When patentability turns on the question of obviousness, the search for and analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or

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suggestion to select and combine the references relied on as evidence of obviousness. (Emphasis added)

"The factual inquiry whether to combine references must be thorough and searching. It must be based on objective evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with. Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. There must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the Applicant. Teachings of references can be combined only if there is some suggestion or incentive to do so."

As stated above, **Fulton, Roth and Roth II,** do not motivate or suggest to a **person skilled in the art to combine these references to duplicate the claims of the present invention.**

Fulton describes a control system including a network of distributed programmable controllers and especially a method and a system for peer-to-peer interlocking in high speed transmission of relatively small amounts of data among the controllers. Further, the use of CRC checksums for data validation is described by Fulton.

Safety-relevant aspects of an automation bus system are not mentioned in Fulton. Further, there is no information given with regard to manipulating data transmitted on a bus.

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Roth II concerns a process for processing safety-relevant data in a safety system with several nodes connected in a bus ring, wherein in parallel in each node are processed, the data received by it and are retransmitted to the next node. For diagnosis purposes a diagnostic unit is provided which passively receives the data present in at least one mode.

However, the diagnostic unit described in Roth II is not suited to manipulate bus data (column 2, lines 22-24) and is therefore also not suited to influence the data transmitted on the bus by overwriting, deleting or inserting data items.

Dorchak (prior art made of record and not relied on) describes a hierarchical system for real-time process control, which incorporates artificial intelligence. Also Dorchak gives no hint to manipulating the data of a bus datastream.

Therefore, subject matter of claims 32 and 47 is not obvious in view of the teaching of Fulton, Roth II or Dorchak.
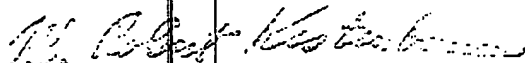
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Wherefore, further consideration and allowance of the claims in this application is respectfully requested.
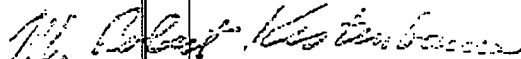
A three-month extension of time in which to respond to the outstanding Office Action is hereby requested. Credit Card Payment Form PTO-2038 is enclosed to cover the prescribed Large Entity three-month extension fee of $950. Please charge any additional fees or credit any overpayments to Deposit Account 11-0665. A duplicate of this page is enclosed for this purpose.

Respectfully submitted,

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I hereby certify this correspondence is being submitted to Commissioner for Patents, Alexandria, VA 22313-1450 by facsimile transmission on January 21, 2004, fax number (703) .746-7239

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